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**A METHODOLOGY
FOR CONDUCTING SPACE UTILIZATION STUDIES WITHIN
DEPARTMENT OF DEFENSE MEDICAL FACILITIES**

A Graduate Management Project

Submitted to the Faculty of

Baylor University

in Partial Fulfillment of the
Requirements for the Degree
of

Master of Health Administration

CPT Timothy J. Rhodes, MS

July 1992

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Abstract

The purpose of this study is to determine and validate an objectively based methodology for conducting space utilization studies for Department of Defense (DOD) medical facilities. This study develops a methodology for evaluating the use and distribution of existing space within DOD Medical Facilities. A computer-aided design (CAD) program is used to update the existing space program and floor plans. DOD Medical Space Planning Criteria and other statistical reports and documents are then applied to determine the amount of space authorized for each department or service within the medical facility. Actual space, as determined by the CAD update, can then be compared to authorized space in accordance with recognized governmental standards for medical space. This methodology is generalizable and applicable to other DOD medical facilities. New DOD funding policies coupled with a declining resource base will require improved space management activities within the DOD. Using this methodology as a management tool, medical treatment facility commanders will have access to objective and quantifiable information on which to base space management decisions. This methodology also affords commanders an opportunity to enhance productivity as a direct result of an improved space management plan.

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Introduction

General Information

Today, many military health care organizations are struggling with space allocation problems. These problems are a consequence of many factors, such as changing strategic initiatives, increased mission requirements and advances in medical technology. There seems to be an insatiable need for additional space in all military health care facilities. As Department of Defense (DOD) health care facilities attempt to maintain appropriate levels of care for their beneficiary populations, the trend for ever increasing space requirements is not likely to change. Although DOD is currently downsizing the force structure, the health care beneficiary population will not see a concurrent reduction in the near term. During the next five years, the Army will be downsized by approximately 33% . However, the beneficiary population will be reduced by only 11% (Cornell, 1992). This disparity is due to the fact that many active duty soldiers will retire, and they and their family members will remain in the DOD Health Care System. Therefore, it is imperative that the available space within military health facilities be used in a manner that maximizes

efficiency and productivity.

The military health care facility chosen for this study is William Beaumont Army Medical Center (WBAMC), located in El Paso, Texas. WBAMC is representative of most modern DOD health facilities in terms of design characteristics. After 1965, all DOD medical facilities were designed and constructed in accordance with established DOD Medical Space Planning Criteria (Psfannstiel, 1992). Therefore, it follows that the results of this study, a methodology for conducting space utilization studies that is based on DOD Medical Space Planning Criteria, should be applicable to other modern DOD medical facilities.

Demographics

WBAMC is a regional tri-service tertiary care teaching medical center with five intensive care units and a dialysis unit. With 464 beds and 12 general inpatient wards, WBAMC serves over 100,000 beneficiaries in its catchment area. Of this number, the active duty population accounts for 16.7% of the total beneficiary population. Family members account for 29.8% of those eligible for care (WBAMC Gateway to Care Decision Briefing, 1991). The remaining population consists of military Veterans Administration Beneficiaries (VAB), military retirees, federal prisoners and

beneficiaries from the Indian Health Service.

Conditions Which Prompted the Study

WBAMC has been identified as one of the 11 medical treatment facilities in Health Services Command (HSC) to implement the "Gateway to Care" (GTC) initiative. The GTC program, HSC's managed care initiative, centers around the recapture of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) dollars within the catchment area. The following GTC initiatives have been implemented at WBAMC: (a) opening of CHAMPUS psychiatric inpatient ward; (b) establishment of an open heart surgery program, to include angioplasty; and (c) expansion of the primary care base through establishment of the Logan Heights Primary Care Clinic. The CHAMPUS psychiatric recapture program is staffed by contract civilian mental health providers who will provide adult inpatient care for patients admitted to Ward 11 West in the main hospital building.

In 1991, the CHAMPUS bill for the WBAMC catchment area exceeded \$17 million. There are several ongoing projects designed to recapture CHAMPUS expenditures as part of the GTC initiative; and without

exception, each of these projects will directly or indirectly impact on the already overcrowded main facility.

One of the primary impediments to implementation of WBAMC's GTC program is lack of space within the facility (Proctor, 1991). The psychiatric recapture program has already resulted in the conversion of approximately 13,000 square feet of medical ward space into an inpatient psychiatric facility. Other projects, to include the cardiac catheterization, open heart surgery and expansion of the primary care base, will all place additional demands on space at WBAMC.

By almost any measure, current demand for health care in WBAMC's catchment area exceeds availability within the main facility. Patients have difficulty getting physician appointments due to the extensive demand and limited availability of outpatient appointments. Clinic appointments, when made available through the Patient Appointment Scheduling System (PASS), are taken literally within minutes. Some outpatient clinics, such as Dermatology, Optometry, and Orthopedics, are closed except for treatment of active duty soldiers. Appointments for some routine procedures have excessive waiting times (e.g., mammography, 4 months; pap smear, 2 months). Inpatient care is normally available for most specialties but is

restricted at times by shortages of nursing staff and/or lack of intensive care beds (Proctor, 1990). It is possible that inadequate distribution of available space within the facility could be a contributing factor to the problem of access to care. A lack of physician examination areas/office space within a clinic could lead to restricted patient flow and a decrease in productivity, thus compounding the problem of limited access to care.

Clearly, WBAMC like most all military health care facilities, is experiencing problems in space management. Many of the clinics in the main facility are overcrowded with patients and have limited space, making the delivery of quality care difficult. This has resulted in the expansion of outpatient facilities to the Logan Heights area of Fort Bliss. Even with these expansion efforts, overcrowding in the main facility continues to be a problem.

In addition to problems associated with the economics of healthcare delivery at WBAMC is the issue of outdated floor plans for the main hospital building. The main hospital building was constructed in 1972 and has undergone numerous minor construction projects during the past two decades. Unfortunately, these changes have not been integrated into the original floor plans. In addition, departments are no longer located as

shown on the original floor plans. Therefore, a space utilization study at WBAMC could not be undertaken until existing floor plans and departmental locations were updated and analyzed. The methodology developed in this study provides a provision for the update of existing floor plans.

A comprehensive and detailed evaluation of the available space within the main hospital, along with recommended solutions to alleviate overcrowding and inappropriate utilization of space, is needed. However, a complete space utilization study of a large medical teaching facility is a complex and time-consuming undertaking. This task becomes increasingly difficult when there is no accepted methodology for conducting space utilization studies.

Statement of the Problem

There is no DOD standardized methodology for analyzing and reallocating space at WBAMC and other DOD medical facilities. Without an objective methodology for conducting space utilization studies, the leadership at WBAMC and other DOD medical facilities are unable to make fully informed space management decisions. This presents a

significant management problem for the commanders and staff of the GTC sites. Since one of the objectives of GTC is to increase access to care, an additional burden in terms of patient demand and space requirements can be expected. Existing space must be allocated in a manner that maximizes its utility. Without an objective and empirically grounded methodology for conducting space utilization studies for WBAMC and other DOD medical facilities, space management decisions will continue to be based on subjective methods.

Literature Review

Despite proper strategic program planning and optimal interpretation of projected service needs in physical facilities, the need for unanticipated building and space allocation changes can be expected (Hardy & Lammers, 1986). In most hospitals, change is continuous--something is always in the process of being added, remodeled, or moved. Every addition or change brings a chain of unexpected events that occur outside the spectrum of the strategic business plan (Allen & Karolyi, 1976). Many facilities have had to divert space from inpatient areas to meet the burgeoning requirements for ambulatory care facilities. More space is being diverted to

accommodate sophisticated, high technology ancillary support, to include new methods of therapeutic and diagnostic procedures. These accommodations are being accomplished at the expense of inpatient areas. The trend toward outpatient care will continue, with approval for many new procedures to be done on an outpatient basis (Malkin, 1990).

Malkin (1990) suggests that medical space planners will need to become familiar with new medical procedures and techniques to properly integrate them into outpatient facilities. For example, cardiac catheterization is now being performed in ambulatory surgical centers. Magnetic resonance imaging technology makes it possible to examine and diagnose many diseases non-invasively, sparing lengthy admissions and work-ups.

In addition, most medical treatment facilities within the DOD Health Care System will soon be budgeted under a prospective payment system based on diagnosis-related groups (DRGs). Based upon a list of some 470 DRGs, the facility will receive a flat fee, regardless of actual cost. DRGs have already caused a shift from inpatient to ambulatory care as well as a trend toward earlier inpatient discharges in the civilian health care community (Coile, 1990). The shift to a prospective reimbursement system

will undoubtedly occur in the military sector as well, since the same incentives for cutting cost will be present. Therefore, it is becoming increasingly important for military administrators to understand the implications of this type of reimbursement system and its relationship to space within a facility. The shift to a prospective payment system and outpatient care will generate a greater demand for space for ambulatory services and outpatient clinics.

Beginning in Fiscal Year (FY) 1992, WBAMC and the other GTC sites will receive funding based on a capitated rate. This capitated rate is based on the number of beneficiaries in the catchment area, combined with historical data on local patient-care cost (Noyes, 1991). A catchment area is a geographical area comprising a 40 square mile radius around the medical treatment facility. This method of budgeting is a departure from the traditional methods and is designed to promote efficiency and cost containment. A capitated system will ensure that HSC hospitals are not rewarded for wasting resources or punished for efficiency, as was the case under the previous system of the Medical Care Composite Unit based reimbursement (Noyes, 1991).

These changing perspectives in military health care will likely cause

increased competition for the available space within WBAMC and other military health care facilities. As is too often the case in space management decision making, space will likely be assigned or reassigned not because of the rationalized needs of a department, but rather because of the reputation or the political strength of the chief of a service or head of a department. The result will be a splitting and fragmentation of functions; some areas will be unsuited to their functions, and circulation patterns could become even more complicated (Allen & Karolyi, 1976). Therefore, it is vitally important that space utilization studies at WBAMC and other DOD medical facilities be conducted based upon objective criteria.

Over the next few years, efficient utilization of space will become more critical. The downsizing of the force structure and economic measures aimed at reducing physical plant inventory will generate competition for existing buildings at some installations. Nonmedical units and agencies will try to gain control of buildings housing medical treatment facilities (Hensrud, 1991). It is vitally important that commanders know how much space they have and whether or not it is fully used. An accurate, up-to-date space utilization survey encompassing all facilities is an important first

step in preparing to defend ownership of space and to justify new construction (Hensrud, 1991).

Bulla (1992) suggests that space management is going to take on new importance because of recent changes in DOD funding policy. The FY 93 Defense Health Program Appropriation will be funded to reimburse all facility operations and maintenance, to include utility usage and other engineering services, such as fire protection, snow removal, pest control, etc. Many of these costs will be charged against square footage occupied. Bulla (1992) feels that facilities that are not needed and do not provide a return on investment of a significant value should be divested. This change is of particular interest to space managers, because for the first time, DOD medical facilities will be paying for the space they occupy.

Although the literature is replete with information pertaining to medical space planning for new facilities and space studies for small segments of hospitals (e.g., Rees, 1980; Reed & Souliotis, 1982; Jeansonne, 1982; Craig, 1972), there is little information pertaining to hospital-wide studies that adequately address redistribution of existing space. Given the current climate in the DOD with regards to increased funding constraints, base closures, and downsizing of the force structure, it is readily apparent

that DOD medical facilities should not anticipate significant funding for expansion and renovation projects. Although the literature does focus on construction and renovation, much of the content and design of earlier space study methodologies are still applicable and serve as a basis for the development of a methodology that would satisfy the needs of DOD medical facility space managers.

Rees (1980) developed a demand model for calculating hospital space needs. This model takes into consideration time, workload, functions and other data in determining the planned space program. Jeansonne (1982) suggests that a functional analysis approach to space management will provide several benefits to hospital organization. This approach entails the distribution of questionnaires to the administrative and clinical staff to obtain current and projected information related to workload, market considerations and physician staff profiles as well as a manager's problem statement. The problem statement approach allows managers the opportunity to elaborate on any problems or inefficiencies that may be present at the department level. Projected and future workload is utilized in order to determine space authorizations as well as the financial targets for space expansion planning. Based on an analysis of these factors, a

space program is then generated.

Another approach to space utilization study was developed by Reed et al. (1982). This approach involved an inventory of actual space conducted by engineering teams. The team's first obtained room coding schemes utilized by the Housekeeping Service to determine available space within the hospital. Next, the teams interviewed staff members to ascertain suitability of the current space distribution. Staff members were asked to estimate (in percent levels) how much space is available to satisfactorily perform the required services. They were then asked to estimate (in percent levels) how much space was necessary to perform services. This information was then collated and analyzed to develop the new space plan.

Reed et al. (1982) also believed that presenting the "facts" of actual or available space as compared to the actual need for space makes the acceptance of moves and renovation/expansion both justified and necessary to the success of the space management plan. In addition, Reed et al. (1982) feel that this particular space inventory process produced a controlled plan which created a climate for commitment and cooperation among the staff.

Traditional methods of analyzing space are now giving way

to "state of the art" methods. One such method involves the application of Computer Facilities Management Programs (CAFM) with Computer Aided Design (CAD) capabilities. CAD involves the input of "blueprints" of a building into a database. This CAD database can then be updated to include changes to the physical facility since construction. Many other attributes, to include room layout, remodeling, cabling, phone lines, bed locations, oxygen systems, etc., can then be superimposed to show differing structural layers within the hospital. In addition, space planning tools from CAD, which are linked directly to the primary database, provide fast, accurate room space information.

One study (cited in Kimmell, 1991) reveals a broad acceptance of CAFM applications. According to the survey results, 47% of respondents are using CAFM in at least one application area. The four leading application areas were architecture, design, space inventory and space planning. Top management reported better internal customer service and more data for decision making as CAFM's most important benefits chosen from among a list of 13 benefits. Management also recognized increased productivity due to improved space management as a major benefit.

DeChant and Spear (1990) cite several institution-wide benefits of

facility management automation, to include (a) the ability to identify current discrepancies in space allocation among users and to develop relevant space standards for such uses; (b) the ability to provide basic information on space and respond to special inquiries through the development of current composite floor plans of a room-by-room database; and, (c) the ability to concretely analyze space productivity, including revenue per square foot and other productivity indicators.

According to Hartman (1990), many health facilities are using in-house CAD capabilities and are converting their old, archived floor plans or mylar drawings into CAD-generated record drawings. However, many other facilities have contracted with outside CAD companies to perform these same conversions. CAD-generated drawings can then be linked to numerical database programs, such as dBase or Microsoft Excell, to yield statistical reports that can profile the health care facility.

Ladeen (1989) feels that the investment in CAFM/CAD saves organizations money in the long run because facility managers have an effective way to keep track of fixed assets. As soon as a move or a new piece of equipment is delivered, CAFM/CAD can update the space management plan. In addition, CAD/CAFM systems can serve throughout

the life of a facility as the foundation for revamping layouts, upgrading technology, scheduling maintenance, handling expansion and reduction in square footage, and addressing a myriad of related facility management tasks (DeChant et al., 1989).

Bulla et al. (1992) points to future economic competition for fixed assets within DOD. DOD health care facilities can ill afford to support activities that are inefficient and not cost effective or that do not add significant value to the organization. Facilities management strategies must take into account measures that reduce labor for planning, design, and management and at the same time reallocate valuable institutional space, a capital asset.

Allen and Karolyi (1976) state that space planning is not a science, nor is it an art to be practiced by talented designers working in seclusion; neither is it a chore to be resolved through manipulations of pat formulas. Allen and Karolyi (1976) contend that space planning is a methodical task requiring consideration of a broad number of factors which differ in specific situations. One could conclude that any study examining the allocation of space within military hospitals should be conducted in the same fashion. However, any methodology for analyzing space in military

health care facilities must be conducted and based on objective information and criteria.

Purpose Statement

The purpose of this study is to determine a methodology for conducting space utilization studies at WBAMC and other DOD medical facilities. Objectives of the study include the analysis of space allocation procedures used by WBAMC, DOD, Veterans Administration (VA), and civilian health care organizations. Of particular importance are the (DOD) Medical Space Planning Criteria, and the WBAMC's Strategic Plan as they relate to current and future demand for space. This study will analyze space requirements based on objective criteria; such as, workload, staffing, and other productivity related measures. In addition, known changes in mission requirements and graduate medical education will be taken into consideration.

Methods and Procedures

The determination of a methodology for space utilization studies began with a thorough review of the literature to determine how other medical

facilities conduct similar studies. Subject matter experts at the American Hospital Association; Office of the Surgeon General, Health Facility Planning Agency, Health Services Command, and the VA were consulted to provide assistance in the determination of the methodology.

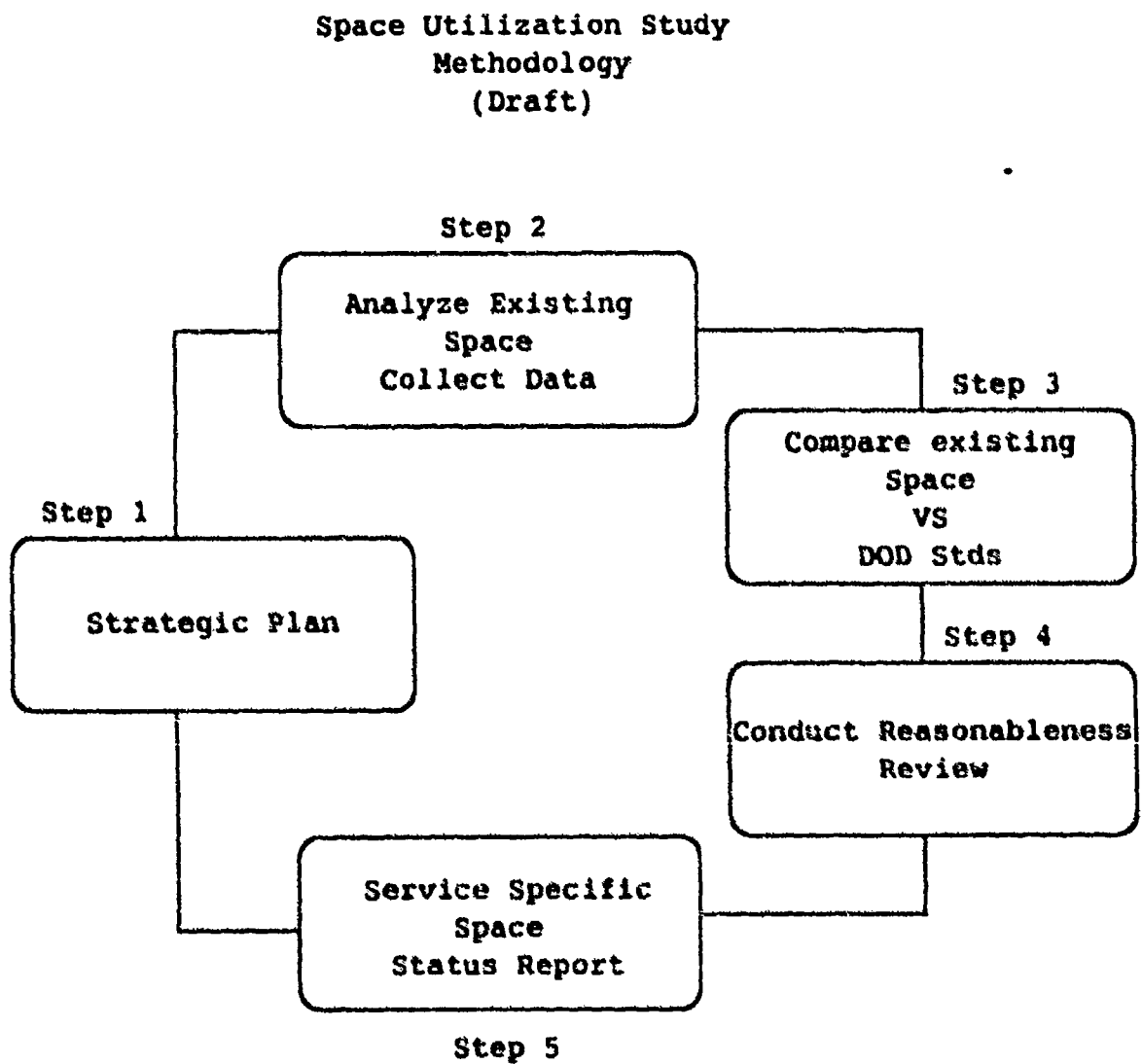
Development of Draft Methodology

Upon completion of the literature review and consultation visits, a draft methodology was developed, integrating key components of several methodologies from the literature with new concepts used in architectural design and space management. This methodology allows for the analysis of space at the department, service or division level of the hospital. The term service will be used to describe organizational activities (departments, divisions or services). It should be noted that departments are the largest activities in Army medical facilities and are comprised of services. Divisions and Services are normally separate activities with administrative and or clinical functions.

A revised methodology will be developed out of concepts and procedures contained in the draft methodology. The revised methodology will allow space managers to conduct facility-wide space utilization studies.

Using the methodology shown in Figure 1, a space utilization study was

Figure 1. Draft Space Utilization Study Methodology Developed for Field Verification.



conducted for the Occupational Therapy (OT) and Physical Therapy (PT) Services at WBAMC. This study was conducted in order to provide a field verification of the efficacy and viability of the methodology developed in this study.

Review of Strategic Plan

Using the draft model, the first step was to review the WBAMC Strategic Plan in order to ascertain the existence of projected changes in mission, policy, services provided, beneficiary population or any other factors that might influence future space requirements for the OT and PT Services.

Data Collection and Comparative Analysis

The next step was to gather information on existing space for the second floor (location of OT and PT Services) of the main hospital building. Upon initial investigation and consultation with WBAMC's engineer liaison, it was discovered that the existing mylar drawings/floor plans are outdated and inadequate for extracting the information necessary to conduct this study. As previously mentioned, these drawings/floor plans are the originals and have not been updated since 1972. Therefore, a contract was awarded to an outside architectural firm, or CAD service

bureau, to prepare drawings for areas under study in the hospital building. The cost of the contract was approximately 9 cents per foot, for a total of \$7,560 for 84,000 square feet of floor space. Upon completion of the performance of this contract, the necessary information for space comparisons was available.

Using the L/D Medical Space Planning Criteria, also referred to as DOD Space Standards, other pertinent regulations and documents, and current and future mission requirements (obtained from the Strategic Plan), a comparative analysis of actual space was conducted. The DOD standards require that a functional assessment of space be conducted for each service. The functional area assessment is a process involving the application of staffing levels, workload and other inputs to the DOD standards in order to determine the amount of space each functional area is authorized. Functional areas include administrative, clinical, support, special programs, etc. Rees' (1980) demand model which utilizes time, workload and service functions in the calculation of space requirements, is similar to the functional area assessment step outlined in the DOD Space Standards and expanded on in this study.

The DOD Space Standards employ several data inputs used in the

computation of authorized space. The data inputs used in the computation of space for the OT and PT Services include patient visits for the previous 12 months and staffing levels as of 1 May 1992. Each functional area within the OT and PT Services was analyzed to determine the amount of space authorized by the DOD Space Standards.

Reasonableness Review

A reasonableness review was then conducted to verify the accuracy of the information and data inputs regarding the OT and PT Services. The reasonableness review was conducted with the chief of each service. As outlined in the DOD Medical Space Planning Criteria (1990), a reasonableness review should be conducted in conjunction with space planning in order to assure a sound rational defense for facility design. This concept can be adapted to space utilization studies since space allocation and distribution are based on facility design requirements. In addition, inconveniences and discomforts which may exist for building inhabitants, as well as deterrents to meeting objectives of patient care, can be analyzed during the reasonableness review. This concept is similar to those employed by Reed et al. (1982), where engineering teams interviewed hospital staff members to analyze space requirements. Like

the methods used by Reed et al. (1982), the reasonableness review also provides for a climate of cooperation and commitment between space analysts and members of the hospital staff.

Service Specific Space Status Report

A service specific space status report is then generated. This report is a compilation of space deficiencies (overages/shortages) by functional area. The information contained in this report forms the basis for redistribution of space within the department, division or service. Most often, sufficient space within the service is not available to meet space requirements. In this case, space may need to be reallocated between departments, divisions or services. This requires a facility-wide space utilization study. Services that possess excess space, compared to DOD Space Standards, may be required to transfer space to those services with space deficits. The revised model for conducting space utilization studies will address this concept.

Once space deficiencies have been corrected, continual monitoring of the strategic plan is necessary in order to ascertain the impact of mission changes upon service space requirements.

Results

Occupational Therapy

The results of the space utilization study for OT Service indicate a 2,112 net square foot space deficit for that service. Space deficits exist within the administrative, clinical and support areas of the OT Service. The functional area assessment for the OT Service is depicted in Table 1.

Table 1. Functional Area Assessment for the Occupational Therapy Service

<u>Functional Area</u>	<u>Space Authorized by DOD</u>	<u>Actual Space</u>	<u>Deviation</u>
Administrative	785	420	-365
Clinical	2,460	1,666	-795
Special Programs	220	0	-220
Educational	100	0	-100
Support	805	173	-632
Totals	4,370	2,258	-2,112

Note - Space is measured in net square feet.

Space deficits also exist in the areas of educational and special programs, although not as severe.

The review of the strategic plan indicated a general awareness of the need for increased emphasis on space management, as this issue is considered critical to the accomplishment of the WBAMC mission. However, there is little usable data or information contained within the strategic plan to support a change in the present level of care provided by the OT or PT Services. Any change in the number of patient visits or staffing levels could have a proportional impact upon space requirements for each service. Therefore, a complete review of the organization's strategic plan is necessary in order to ascertain this information. It should be noted that the WBAMC Strategic Plan is currently under revision and will include information concerning service specific usage patterns.

Although the GTC initiative will have a significant impact on increased access for many services within WBAMC, it is anticipated that both patient visits and staffing for the OT and PT will remain relatively unchanged over the next few years (Popejoy, 1992). The DOD/VA joint venture could have an impact upon OT service when the VA Outpatient Clinic is built two or three years in the future. This clinic will be collocated with

WBAMC. There is ongoing discussion about which services the OT Services will provide and to what degree. If patient visits are expected to increase, this data would be entered into the DOD Space authorization calculations, as outlined in step three of the methodology. However, in the absence of a well-defined impact regarding DOD/VA joint venture, current data must be utilized.

Following the methodology shown in Figure 1, the actual space measurements of the OT Service were obtained from the CAD survey of the second floor of the main hospital building. These measurements were compared to the DOD space requirements for each functional area within the OT service. Appendix A includes actual space distributions by room and functional area for the OT Service. This information was used to compute deviations from space authorized according to DOD Space Standards. Copies of the CAD-generated and original floor plans are also included at Appendix A. It should be noted that the CAD-generated floor plan is easier to read yet contains much more detail than the originals. The actual space distribution listing was produced in conjunction with the CAD update of the second floor by the CAD contractor. Cross referencing the actual room space distributions to the floor plan allows for visual

identification of each room by number as well as the identification of the actual space contained in each room and functional area. In addition, equipment and bed locations and other attributes can easily be included in the CAD-generated floor plans.

The DOD Space Standards used to calculate the authorized space for the OT Service are located at Appendix B. DOD space standards employ net square feet (NSF) as the measure of space. NSF is defined as the space within the functional area that is usable. Areas such as walls, structural supports and elevators are not included in the NSF measurements. The OT Service functional areas of administration, clinical, special programs, educational and support are detailed within the DOD Space Standards.

Appendix C lists the inputs to the DOD standards for the OT Service. The calculations used in determining these inputs are also shown. The data used to determine inputs to DOD space standards, include, but are not limited to, average patient visits over time (May 1991 - April 1992), staffing levels (current as of 1 May 1992), number of hospital beds, type of services offered by the facility, as well as other special hospital missions. Not all of these data inputs are required to calculate space requirements

for each specific service within a facility. However, all space requirements in DOD health care facilities are based on staffing and workload as a minimum. For the purposes of this study, only those inputs necessary for evaluation of space requirements/authorizations were used.

Appendix D shows the application of the actual inputs (outlined in Appendix B) into the DOD Space Standards for the OT Service . The NSF column indicates the authorized space for each functional area, including the sub-components of each functional area; specifically, physical areas, services performed and equipment.

Physical Therapy

The same processes and steps used to calculate the space requirements for OT Service were used to calculate the requirements for the PT Service. Applying this same methodology to study the space occupied by the PT Service reveals a 1,869 NSF deficit of authorized space according to the DOD Standards. This represents slightly less than one-third of the total DOD space authorized for the PT Service. Table 2 depicts the results of the functional area assessment for the PT Service.

The greatest space deficits exist in the functional areas of storage and support areas. These are critical areas within the PT Service due to the

number and size of equipment that must be stored and maintained by the service. The total space deficit presents a difficult management problem that must be taken into consideration due to issues concerning quality of care and productivity.

Table 2. Functional Area Assessment for Physical Therapy Service

<u>Functional Area</u>	<u>Space Authorized by DOD</u>	<u>Actual Space</u>	<u>Deviation</u>
Administrative	440	556	+ 116
Cubicle	800	893	+ 93
Exercise/Rehab	1,880	2,075	+ 195
Storage Areas	376	78	-298
Hydrotherapy Areas	490	676	+ 186
Support Areas	1,590	379	-1,211
Special Treatment Areas	850	0	-850
Clinical Education	100	0	-100
Total	6,526	4,657	-1,869

Note: Net Square Feet (NSF) is used for all measurements.

Discussion

The discussion is divided into two sections. First, the service's (OT and PT) specific implications of the study results are analyzed, which will provide a basis for the rationale used to formulate a revised methodology model. The revised methodology model will then be discussed in detail.

Occupational Therapy

The results of the OT Service space utilization survey indicate that a total space deficit exists, based on present levels of staffing and recent historic workload. One contributing factor to the space deficit that exist within the functional area of administration was identified upon entry into the clinic. Three desks line the wall of room 2-353 (clinical area). These desks are utilized by the staff therapists who, according to the DOD Space Standards, should have his/her own office space located separately from the clinical areas. Not only does the collocation of office space with clinical treatment areas confound an already existing problem of insufficient clinical space, it also denies the individual staff therapist the privacy he/she needs when counseling employees or patients.

Another contributing factor to the space deficit is that Room 2-353A is

no longer used for its intended purpose; i.e., storage of power equipment. The power equipment room is not large enough to house all of the equipment that has been developed over the years and is now considered "state of the art." Therefore, because space limitations do not allow for full use of this equipment, other treatment modalities are opted for by the staff. Due to the staff's inability to provide care using the latest techniques, questions regarding compliance with the appropriate standards of care could reasonably be raised.

Physical Therapy

There are numerous management problems associated with the space deficiencies in the PT Service. Specifically, the space deficits in the functional areas of storage, support and special treatment are the most critical. These deficits combine to create a negative synergistic effect with regards to space management. The problems associated with the total functional areas' space deficits are greater than the negative effects created by individual functional area space deficits. For example, the storage area space deficit precipitates or confounds space deficits elsewhere in the clinic. Wheelchairs, walkers, crutches, linen and other items are actually stored in space that was originally designed for exercise/rehabilitation

areas. Large, often heavy pieces of exercise equipment are congested in the clinical area to make room for storage of items that should have dedicated storage space. Due to this problem, PT personnel must physically move equipment into areas that happen to be vacant at the time. Issues that can be associated with this problem include decreased productivity and increased patient waiting time which ultimately contribute to further limitation of access to care. In addition, work-related injuries could easily occur as a result of PT personnel physically moving heavy pieces of equipment that were designed to remain stationary.

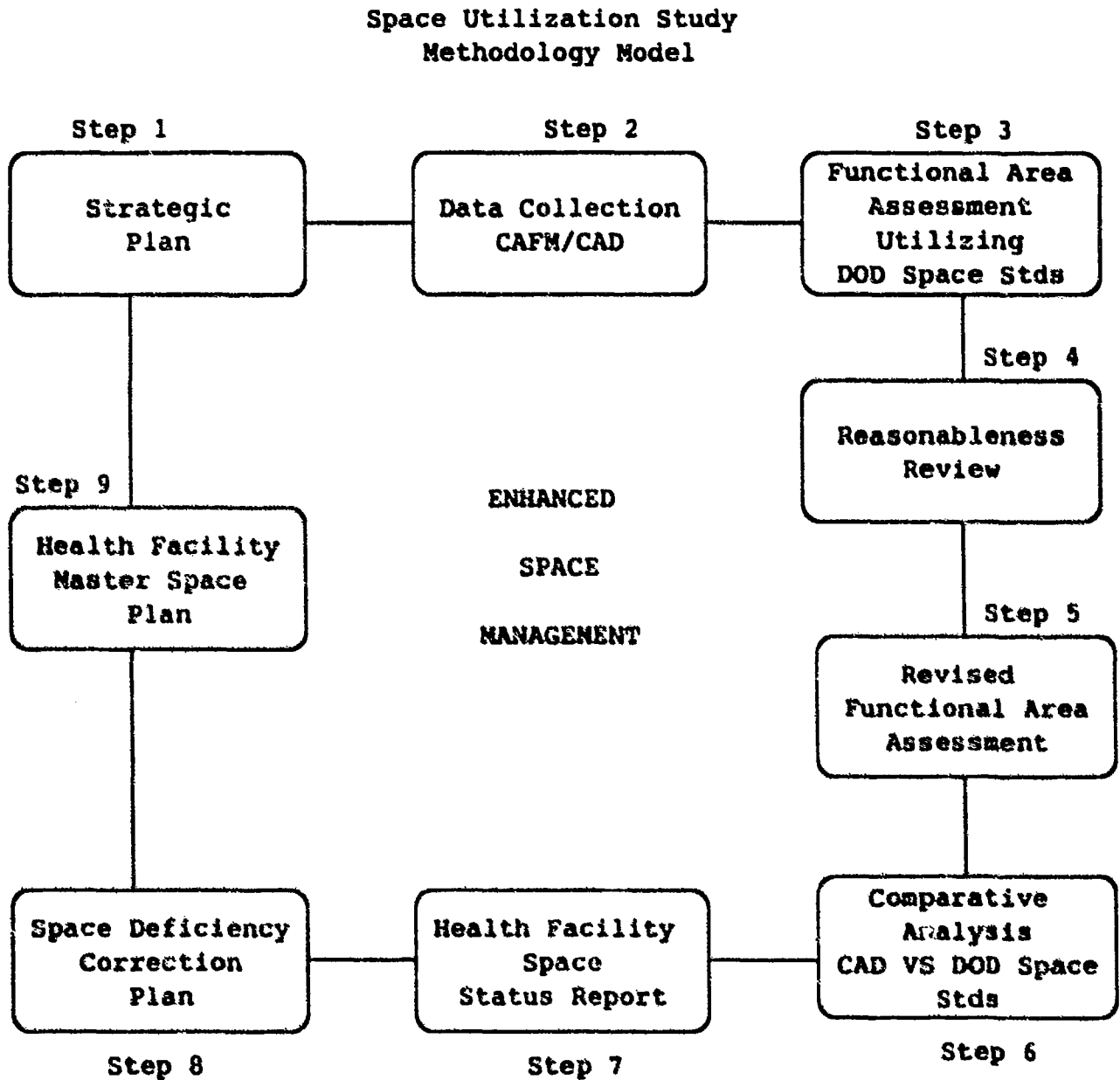
Another issue that surfaced includes the lack of special treatment areas. The PT Service at WBAMC provides several special services to include amputee training and pediatric rehabilitation. The 195 NSF, considered excess in the clinical areas, could be utilized to offset this deficit; however, a deficit of over 600 NSF would still exist. As discussed earlier, the clinical areas are already short of space because they are also being utilized as storage areas. The deficit in special treatment space is a major concern with regard to pediatric rehabilitation. Child treatment areas are presently collocated with the adult treatment areas. This could potentially create safety hazards for the adults as well as the children.

The Revised Methodology

The verification process of the methodology served several purposes. First and foremost, it revealed several weaknesses of the methodology. Weaknesses of the methodology were thoroughly analyzed in order to provide a sound basis for the construction of a revised methodology which contains three extra steps. These steps include, a step to allow for the revision of the functional area assessment, a step used to formulate a health facility space status report and a step for the creation of a health facility master space plan. Figure 2 depicts the revised Space Utilization Study Model. The discussion and analysis of the revisions to the draft methodology will follow.

One problem discovered during the verification of the draft methodology was that the procedural components, or steps, of the methodology did not completely fulfill their intended purposes. The purpose of the data collection step is to obtain accurate information to be used in the calculation of authorized space. This particular problem, associated with step 2 of the draft methodology, did not allow for the collection of the most current information pertaining to the services under study. Therefore, in order to increase the reliability and validity of the

Figure 2. Revised Space Utilization Study Methodology Model.



data used to calculate DOD authorized space, an additional step was added. This step allows for the reassessment of the functional areas (step 5) before comparisons to the DOD Space Standards are accomplished. It was discovered that a preliminary functional area assessment (step 3) should be conducted prior to the reasonableness review. Completing the functional area assessment in draft form allows the researcher to become familiar with the service and its specific functional areas prior to meeting with the service chief. The interview (reasonableness review) with the chief serves an important function with regards to enhancing the face validity of the inputs to the DOD standards. Special Program requirements, special considerations regarding workload data, and the most current data on staffing levels can only be obtained via a face-to-face interview with service personnel.

After meeting with the chief of the OT Service and conducting the reasonableness review (step 4), several changes to the functional area assessment were required. Specifically, the report used to gather data for workload did not separate the OT workload performed at the Consolidated Troop Medical Clinic (CTMC) from the OT workload performed in the main hospital clinic. The chief of the OT Service discovered this

discrepancy soon after the reasonableness review began. The inclusion of the CTMC workload in the workload total for the OT Service would have been inappropriate as an increase in the total amount of space authorized for the OT Service located in the main facility would have been affected. Therefore the CTMC workload was withdrawn from the OT Service workload total.

It was also determined that a health facility space status report (step 7), should be generated at the conclusion of the comparative analysis (step 6). The draft methodology allowed for the formulation of a service specific space status report. While the information contained in the service specific space status report would be beneficial to the specific service(s) under study, it would not provide sufficient data for facility-wide correction of space deficiencies. Since the purpose of the study was to determine a methodology for conducting space utilization studies on a facility wide basis, a health facility space status report containing the study results of all functional areas is needed. The Health Facility Space Status Report is a compilation of all hospital service functional area assessments that have been compared with DOD Space Standards. This report would provide decision makers with the information necessary to formulate a

plan (step 8) to correct space deficiencies throughout the entire facility.

The Health Facility Master Plan (step 9) is created after the decision-making body has approved the Health Facility Space Status Report and subsequently formulated a plan for correction of space deficiencies. This document could take the form of an updated CAD database. The CAD database contains actual space distributions prior to the implementation of the space deficiencies correction plan. Once all moves or construction are completed, the CAD database would be updated to reflect these changes. The document would then serve as a "living blueprint" and would reflect the current status of space within the facility.

Once the space within the facility has been appropriately allocated based on objective criteria contained in the methodology, changes to the Master Space Plan, or transfer of space, should only be affected by appropriate justification and approval. The process of intra-service or departmental space transfer would require the application of the revised methodology in order to study and justify the need for a change in the Master Space Plan.

The revised methodology also provides a mechanism and forum for space management education within the facility. The process outlined in

the methodology mandates involvement of the hospital staff who occupy the space under study. The field verification provided evidence of the importance of this function. Specifically, both the service chief of OT and PT had intuitively recognized the existence of space deficiencies within their specific clinic. However, prior to the study, these service chiefs did not possess a full understanding of the contributing factors to the space deficiencies. Both service chiefs now have a better understanding of the relationships among workload, staffing, facility type, and the amount of space needed to perform their service specific missions . They are also now fully aware of the space deficiencies that exist within their services and are now cognizant of the fact that a shortage of space in one specific functional area can exacerbate space deficits in other functional areas. These results lend credence to an overwhelming need for a space utilization study methodology that can identify the underlying factors contributing to space management problems within a facility.

Key space management issues were revealed concerning the allocation of space within the services under study (OT and PT). These issues range from the proper identification of space deficiencies in each service to quality of care issues that could reasonably be raised due to the existence

of the space deficiencies.

Conclusions

The revised methodology (shown in Figure 2) can serve as a model for conducting space utilization studies within DOD medical facilities. In addition, this methodology could be adapted for use in civilian facilities that are constructed according to space planning standards. This methodology provides a framework for the acquisition and analysis of the information necessary for an objectively based space utilization study. It also provides a systematic approach for the identification of space deficiencies within health care facilities.

The methodology model is a process that begins with a critical analysis of the organization's strategic plan and culminates with the approval and implementation of the Health Facility Master Space Plan. The methodology combines traditional space utilization study methods with "state-of-the-art" methods of space management used in health care and other industries.

This methodology was developed and field tested at WBAMC. Due to resource constraints and the impracticality of conducting a facility-wide

study within the time constraints of the project, only the first six steps of the methodology could be validated. For this reason, steps seven, eight and nine were not included in the field verification. The development of the Health Facility Space Status Report (step 7), the Space Deficiency Correction Plan (step 8) and the Health Facility Master Plan (step 9) are generated after all health facility functional areas have been analyzed against DOD Space Standards. Although these steps are not verified as part of the field test, the general concepts regarding their role in the methodology will be discussed.

The Methodology

The first step of the methodology requires an analysis of the organization's strategic plan as it relates to space management. Projected changes in the organization's mission and level of services offered should be included in the strategic plan. Any changes or variations from the current mission, in most cases, will influence space authorizations, since the DOD standard for determining space requirements is based on workload, staffing, equipment, activity, etc. Once the strategic plan has been analyzed to ascertain the future direction of the organization, the next step is to determine the actual space distribution within the facility through data

collection.

The process of determining the actual space within the facility, as currently allocated, can be ascertained by the use of CAD or other CAFM systems. These systems are of particular benefit when the health care facility does not have a current facility space program and/or has outdated floor plans. According to Jackson (1992), very few health care facilities within HSC possess current floor plans; and even fewer have a viable facility space program. When the organization does not have a current space program or master plan for space programming, an alternate approach to determining the actual space program is mandated. The use of CAD or other CAFM systems is one approach that provides the space manager with an accurate and timely method for determining actual space distributions. The CAD update of existing floor plans with subsequent field verification of facility structure and floor space will yield accurate information on the actual space occupied by functional area (department or service).

Step 3 is to conduct a functional area assessment, by service, utilizing the DOD Space Standards. Used as an analytic tool for space planning and programming, the DOD Medical Space Planning Criteria will assist the

space manager in determining functional area space programs by translating the functional requirements of a service into space authorizations that are measured in NSF. The DOD standards are based on environmental inputs, including service requirements, staffing, activity and equipment. Once the space manager inputs this data into the formulas outlined in the DOD Space Standards and computes the functional area space requirements, the next step is to conduct a reasonableness review in order to verify and collect additional information about the service or department under study.

This reasonableness review (step 4), as outlined in the DOD Medical Space Planning Criteria (1990), is a subjective evaluation of the information obtained from the functional area assessment. The methodology developed in this study includes a reasonableness review in order to (a) ascertain and validate service specific information that will be used to calculate space requirements (b) enhance the probability that the revised functional area assessment is a true reflection of the service under study, and (c) communicate the rationale and procedures used in the space utilization study to the head or chief of the functional area in order to create a sense of ownership of the study. The review should include a

delivery should always be a consideration and must be consistent with innovations which are emerging in military managed care. If a procedure can be performed more efficiently or effectively through managed care concepts, consideration should be given to the alternative option. GTC, the Army's managed care program, is likely to place additional demands upon facility space requirements. However, the shifting of care, or outsourcing, to alternative delivery systems could lessen the space management impact of the GTC program.

Once the reasonableness reviews have been conducted, the functional area assessment should be updated (step 5). The revised functional area assessment will contain the information necessary to conduct the comparative analysis (step 6) of actual space requirements (generated by the CAD update) and the functional space plan (computed utilizing the DOD Medical Space Planning Criteria).

Step 7 of the methodology requires the space manager to consolidate all functional area assessments by service, in order to complete the Health Facility Space Status Report. The Health Facility Space Status Report is a compilation of all space requirements as verified by the DOD standards and compared to the actual space allocations within a facility. The

differences or deviations from the DOD standards can then be compiled by service and functional area to form the report. The information contained in this document would then be forwarded with recommendations to a decision-making body/committee charged with the responsibility of space management. At WBAMC, this body is called the Facilities Management Committee (FMC). The FMC is chaired by the Chief of Staff, WBAMC, with membership from each clinical department in the hospital. Decisions regarding space realignment within the facility and construction are the responsibility of this committee. This committee must consider many factors when making space realignment or construction decisions, including patient flow, Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards, and other practical considerations. For example, the existence of excess space in one functional area does not always lend itself to redistribution of that space to functional areas not located in the same proximate area. Therefore, the formulation of a well thought out plan for space redistribution, including a chronological space realignment plan, is a difficult task, albeit critical to the success of the facility space management program.

Once the decision-making body has carefully considered all options to

rectify the space deficiencies and has developed a time-phased plan (step 8) to redistribute space or possibly plan for new construction, the space manager can then initiate the final step of the methodology.

The final step (step 9) in the procedure is the implementation of the Health Facility Master Space Plan which serves as the facility blueprint for space distribution. The CAD database could serve as a template for the development of the Health Facility Master Space Plan. As space redistribution moves or construction is completed, the CAD database is updated to reflect the changes. This database can then be converted onto a management document that would serve as the Health Facility Master Space Plan. In addition, the master plan could be continually updated to reflect changes in the mission or other factors that contribute to deviations in space requirements. This is accomplished by continually monitoring changes to the strategic plan.

Recommendations

This study and the methodology developed herein should be forwarded through the Deputy Chief of Staff for Logistics, HSC to the Office of the Surgeon General, Defense Medical Facilities Office for consideration as the accepted methodology for conducting space utilization studies within DOD medical facilities.

In addition, this methodology should be utilized by the newly hired space manager to conduct a facility-wide space utilization study at WBAMC. The Directorate of Engineering and Housing, Fort Bliss, Texas, recently announced a plan to have a CAD update of all tenant buildings at no charge to the tenant. This CAD update will include WBAMC. The information contained in the CAD report could be used in a facility-wide study of WBAMC. Therefore, the timing of the CAD update of WBAMC combined with the formulation of this methodology should provide the impetus for improved space management.

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Appendix A

**OCCUPATIONAL THERAPY SERVICE
SPACE DISTRIBUTION
BY ROOM**

<u>FLOOR - ROOM</u>	<u>FUNCTION</u>	<u>DOD FUNCTIONAL AREA</u>	<u>NSF</u>
2 - 348	LOCKERS	SUPPORT	87.0
2 - 351	STORAGE	SUPPORT	56.0
2 - 353	WORK THERAPY	CLINICAL	1,666.0
2 - 353A	POWER EQUIPMENT	CLINICAL	299.1
2 - 354	STORAGE	SUPPORT	89.6
2 - 359	CHIEF	ADMINISTRATIVE	120.3
TOTAL			2,318.0

Note: The total net square footage of 2,318 is the correct measurement for the OT Service, as determined by the CAD contract. However, during the reasonableness review with the service chief, it was noted that approximately 60 square feet of storage space contained in room 2-354 is not useable for storage purposes. This room also serves as a telephone equipment room. Therefore, 60 square feet is deducted from the total square footage for OT as well as from the functional area total of support. In addition, 300 square feet contained in room 2-353, designated as a clinical area by the CAD contractor, is utilized as a waiting area (administrative area). This area was included in the total for administration.

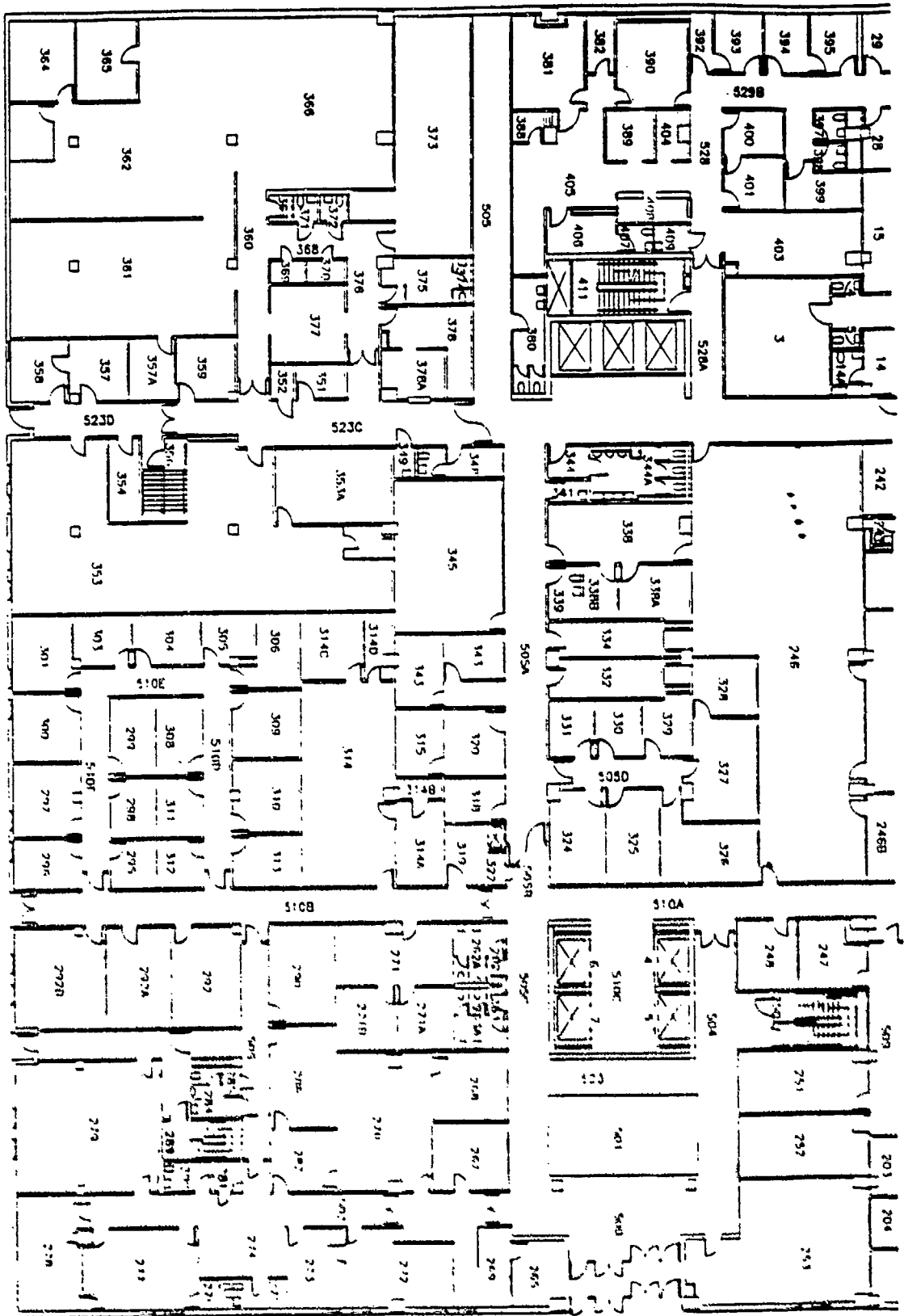
Actual Functional Area Totals are as follows:

Administrative: Room 2-359 (120.3 NSF) + Room 2-353 (300 NSF) = 420

Clinical Areas: Room 2-353 (1,366 NSF) + Room 2-253A (299 NSF) = 1,665

Support Areas: Room 2-348 (87 NSF) + Room 2-351 (56 NSF)
+ Room 2-354 (30 NSF) = 173

Total Functional Area Space in net square feet ----- 2,258 NSF

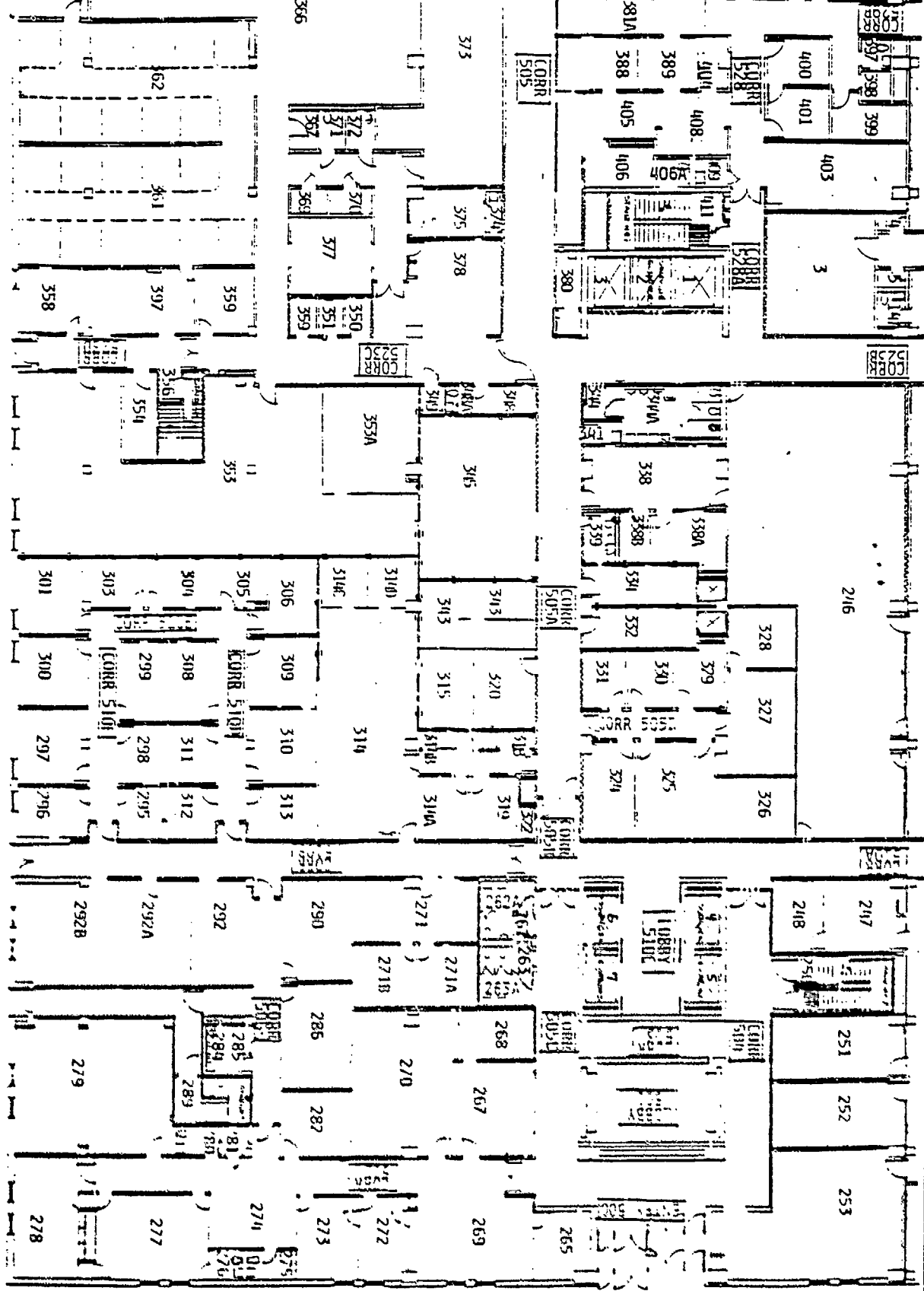


A-2

WILLIAM BEAUMONT ARMY MEDICAL CENTER

2ND FLOOR





LEVEL 2 SOUTH

A-3

NOTE: 1. All room numbers are preceded by 2 -

Appendix B

DOD Medical Space Planning Criteria for the Occupational Therapy Service

1.0 PURPOSE AND SCOPE

This document sets forth the space planning criteria for occupational therapy services within the Department of Defense Health Care Facilities.

2.0 DEFINITIONS

Occupational Therapy is the use of purposeful activity with individuals who are limited to physical injury or illness, psychosocial dysfunction, developmental or learning disabilities, poverty and cultural differences of the aging process in order to maximize independence, prevent disability and maintain health. The practice encompasses evaluation, treatment and consultation. Specific occupational therapy services include: teaching daily living skills; developing perceptual motor skills and sensory integrative functioning; developing play skills and prevocational and leisure capacities; designing, fabricating or applying selected orthotic and prosthetic or selective adaptive equipment; using specifically designed crafts and exercises to enhance functional performance; administering and interpreting tests such as manual muscle and range of motion; and adapting environments for the handicapped. These services are provided individually, in groups, or through social systems.

In addition to the above, service may include evaluation and treatment for sensory integrative dysfunction; evaluation of work adjustment; development of avocational interests and leisure time skills; fabrication of orthotic and assistive devices; clinical education programs for therapist level and or assistant level students and research programs. As appropriate, service may be extended beyond the occupational therapy module to provide home health visits and consultation services to community agencies supporting the military.

Service - A service in this context includes all functions and activities associated with accomplishing the Occupational Therapy mission. This service receives referrals from all medical specialties. At the present time, military Occupational Therapy functions primarily within the medical model. As the profession expands its services into the community in the area of prevention and health maintenance, receipt of referrals from sources other than medical can be expected.

Visit - Each time patients present themselves to the Occupational Therapy Clinic it is counted as one visit. One visit may generate several treatments. Visits to any areas

outside the clinic such as nursing units and homes are not to be counted for space allocation.

Treatment Area - The major treatment area or patient care area is the general clinic area including daily life skills area, evaluation areas, and power tool room area. Space requirements for the above treatment areas are calculated on the basis of projected patient visits per month. When computing actual space requirements, the resulting figures should be rounded to a whole number.

3.0 POLICIES

Waiting Space

Waiting space with appropriate seating as well as open space for the accommodation of wheelchairs and stretcher carts should be considered in the central area.

Physical Space and Equipment

Space and equipment need will vary with the size and scope of the rehabilitation program. There shall be room space adequate to house the activities undertaken as well as office space for the occupational therapist(s).

The activity area shall be attractive and comfortably decorated and furnished to provide an appropriate environment for the diverse activities to be carried on. Adequate work table or bench space and supply storage shall be provided.

4.0 PROGRAM DATA REQUIRED

Number of hospital beds projected

Psychiatric

Pediatrics

Orthopedics

All Others

Total Beds:

Special Hospital Mission

Amputee Training Center

Neurosurgical Training Center

Burn Treatment Center

Pulmonary Disease Center

Renal Dialysis Center

Hand Surgery Center

Oncology Center

Rheumatology Center

Other

Number of OT staff projected
Therapist
Technician (Specialist)
Other
Total Staff:

Projected monthly patient visits

Inpatient

- Psychiatric
- Pediatric
- All Others

Total Inpatient:

Outpatient

- Pediatric
- Orthopedics
- All Others

Total Outpatient:

TOTAL VISITS:

Special Programs

Sensory Integrative Dysfunction
Work Therapy
Avocation and Leisure Skills
Orthotics
Clinical Research
Child-Life Program
Alcohol Rehabilitation Service
Cancer Program
Cardiac Rehabilitation

Clinical Education

Special Study

5.0 SPACE CRITERIA

<u>FUNCTION</u>	<u>NSF AUTHORIZED</u>	<u>PLANNING RANGE/COMMENTS</u>
<u>Administration Areas:</u>		
Control Area (includes ADP space)	120	
Waiting Area	25	per space - 1 space per 200 visits per month, minimum 5 spaces, maximum 15 spaces
Chief's Office	120	
NCOIC Office	100	
Staff Therapist Office	100	80 NSF per therapist greater than 1.
Technicians Office	140	1 for every four techs
<u>Clinical Areas:</u>		
General Clinic	1200	Add 125 NSF for increment 600 visits per month
Daily Living Skills	260	
Shower/bath	70	
Power Equipment Shop	420	
	160	Add to include all power equipment (Medical Center only)
Private Evaluation Area	100	1 per two therapists
<u>Special Program Areas:</u> These areas provided only when programs are supported by appropriate staffing.		
Sensory Integrative	500	

DOD MEDICAL SPACE PLANNING CRITERIA - OCCUPATIONAL THERAPY SERVICE

<u>FUNCTION</u>	<u>NSF AUTHORIZED</u>	<u>PLANNING RANGE/COMMENTS</u>
Dysfunction (SID)		
Work Therapy Office	100	
Mirror Room for SID	100	
Orthotics Area	120	
Clinic Research Office	100	
Child-Life Program Unit	230	maximum 1 per pediatric nursing
Computer Assistant	100	

Educational Areas:

Education Supervisor's Office	100	maximum 1 per clinic
Conference Room/Library	200	
Training Aids Alcove	50	
Student Carrels	30	maximum 1 per student

Support Areas:

Equipment/Device Storage Room	325 225	Medical centers Regional hospitals Subdivide space as required.
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DOD MEDICAL SPACE PLANNING CRITERIA - OCCUPATIONAL THERAPY SERVICE

<u>FUNCTION</u>	<u>NSF AUTHORIZED</u>	<u>PLANNING RANGE/COMMENTS</u>
Wheelchair Toilets:		
Male	60	30 NSF per fixture.
Female	60	30 NSF per fixture
Staff Toilets		
Male (wc, lav)	60	30 NSF per fixture (lav, wc) per 20 men
Female (wc, lav)	60	30 NSF per fixture (lav, wc) per 15 women
Staff Lounge	100	Add 10 NSF per staff for each staff member greater than 10. 200 maximum
Staff Lockers		
Male	100	6.5 NSF per locker
Female	100	6.5 NSF per locker
Janitor's Closet	40	
Patient Toilets		
Male (wc, lav)	60	30 NSF per fixture (lav, wc) per 20 men
Female (wc, lav)	60	30 NSF per fixture (lav, wc) per 15 women

Appendix C

Inputs to the DOD Medical Space Planning Criteria for the Occupational Therapy Service

Inputs to the DOD Space Standards for determining space requirements for the Occupational Therapy (OT) Service at WBAMC are patient visits and staffing.

I. * Patient Visits - Each time patients present themselves to the Occupational Therapy Clinic it is counted as one visit (DOD, 1991). Visits to the OT clinic located in the Consolidated Troop Medical Clinic (CTMC) were deducted in order to provide an accurate account of workload performed in the clinic under study.

Month	Patient Visits	
<u>May 1991 - April 1992</u>	<u>Main Hospital - CTMC</u>	
May	1592	402
June	1234	229
July	1349	411
August	1657	440
September	1478	284
October	1295	209
November	1062	194
December	979	150
January	1031	145
February	973	107
March	1275	292
April	<u>1054</u>	<u>170</u>
12 Month Totals	14,979	3,033
Arithmetic Mean	1,248	253

Input for Main Hospital (1,248 - 253 = 995 visits)

* Source - WBAMC Monthly Statistical/Operation Maintenance Army Fund Status Reports dated 16 October 1991 and 28 May 1992.

II. ** Staffing - The primary staffing inputs to the DOD standards for the OT Service are comprised of occupational therapist and OT technicians (specialist). There are presently three full time OTs and four full time OT technicians employed at the WBAMC clinic. Although several members of the OT staff provide part-time OT services at the CTMC, they maintain their primary office space in the OT clinic in the main hospital building. Therefore space must be allocated for this purpose.

OT Service Staffing

<u>Position</u>	<u>Profession</u>	<u>*** FTEs 1 July 1992</u>
Officer in Charge	OT	1
Noncommissioned Officer in Charge	OT Technician	1
Staff Therapist	OT	2
Technicians	OT Technician	3
Total Staffing		7

** Source - Officer/Key Personnel Assignment Roster for the Department of Surgery dated 1 July 1992.

*** Full Time Equivalent

Appendix D

Application of Actual Inputs to the DOD Medical Space Planning Criteria for the Occupational Therapy Service at WBAMC.

<u>Function</u>	<u>NSF Authorized</u>	<u>*Comments/OT Calculations in bold</u>
<u>Administration Areas:</u>		
Control Area	120	All clinics are allocated 120 NSF for control areas.
Waiting Area	125	25 feet per space - 1 space per 200 visits per month. $995.5 / 200 = 4.9$ or 5. $5 \times 25 = 125$
Chief's Office	120	
NCOIC Office	100	
Staff Therapist	180	100 base plus 80 feet per therapist greater than 1. $1 \times 80 = 80$. $100 + 80 = 180$
Technician's Office	140	140 base and 1 base for every 4 techs.
Total	785	This total represents the administrative area sub-total

- * Items with no comment are standard space distributions for all DOD facilities.

<u>Function</u>	<u>NSF Authorized</u>	<u>Comments/OT Calculations in bold</u>
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Clinical Areas:

General Clinic	1,450	1200 NSF base plus 125 NSF for increments of 600 visits per month $995.5 / 600 = 1.6 \text{ or } 2.$ $2 \times 125 = 250. \quad 1200 + 250 = 1450$
Daily Living Skill	260	
Shower/bath	70	
Power Equipment Shop	580	420 NSF base plus 160 exta NSF for Medical Centers. $420 + 160 = 580$
Private Evaluation Area	100	1 per 2 therapist
Total	2,460	Total for Clinical Areas

Special Program Areas: Only those special programs offered at WBAMC are mentioned.

Work Therapy Office	100
Orthotics	120
Total	220

<u>Function</u>	<u>NSF Authorized</u>	<u>Comments/OT Calculations in bold</u>
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Educational Areas: Note - Not all items mentioned in the DOD standard, for this functional area, are needed at WBAMC.

Conference Room/Library	100	
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A full conference room is not needed. 100 NSF for library reference material is needed. 200 NSF is authorized.

Total	100	
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Support Areas:

Equipment/Device Storage Room	325	
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Medical Centers

Wheelchair Toilets:

Male	30	
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60 NSF is authorized for each male and female restroom. However, the Chief of OT feels that one shared facility is adequate since handicapped restrooms are available in the common area outside the clinic.

Female	30	
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Staff Toilets:

Male	60	
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Female	60	
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Staff Lounge	100	
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<u>Function</u>	<u>NSF Authorized</u>	<u>Comments/OT Calculations in bold</u>
Staff Lockers:		
Male	100	
Female	100	
Patients toilets:		
Male	30	60 NSF are authorized for each male and female restroom. However, restroom facilities are available near the clinic. The chief feels that one shared restroom in the clinic is necessary.
Female	30	
Total	805	